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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,747	10/06/2003	Yoichi Nishino	243627US6	6596

22850 7590 02/02/2007
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EXAMINER	
SMITH, JEFFREY S	
ART UNIT	**PAPER NUMBER**
2624	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/02/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	**Application No.** 10/678,747	**Applicant(s)** NISHINO, YOICHI
	Examiner Jeffrey S. Smith	**Art Unit** 2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 27 December 2006.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-28 is/are pending in the application.

4a) Of the above claim(s) 13-28 is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-12 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 06 October 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 01/2006.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of species I, claims 11-12 in the reply filed on December 27, 2006 is acknowledged. Generic claim 1 (and corresponding generic method claim 10) and dependent claims 2-9, along with claims 11-12 of species I, are examined on the merits. Claims 13-28 are withdrawn. The restriction requirement is made FINAL.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Generic claims 1 and 10, along with dependent claims 2 and 3, are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,764,770 issued to Schipper et al. ("Schipper").

For claim 1, Schipper discloses a correlation detecting means for detecting correlation (see col. 15 lines 19-38, the first image is compared with the second image to correlate the authentication pixels in the images), between said first image data and second image data for reference generated using said predetermined image generating apparatus (see col. 11 lines 57-63, col. 13 lines 23-25, col. 14 lines 51-53 and Fig. 6, authentication information is in pixels of the second image generated using the camera), and an identifying means for identifying if said first image data was generated using said image generating apparatus based on said correlation detected by said correlation detecting means (see col. 15 lines 39-45, if the authentication data in the two images do not substantially agree, the image was not taken by the camera).

For claim 2, Schipper discloses a correlation detecting means that detects said correlation using said second image data displaying a pattern with no correlation with the pattern displayed based on said first image data (see col. 12 lines 13-20 and figure 6 which shows a pattern that is displayed and detected in the image).

For claim 3, Schipper discloses a correlation detecting means cuts out third image data from said first image data based on a first cutout position, cuts out fourth image data from said second image data based on a second cutout position, and detects the correlation between said third image data and said fourth image data a plurality of times by changing said first cutout position and said second cutout position (see figures 9A-9G and col. 18 lines 10-45, the pixel array is decomposed into a plurality of smaller sub-regions, and the correlation of each sub-region of the image with the corresponding sub-region in the reference image is detected. That is, the correlation detecting means cuts out third image data based on a first cutout position, and cuts out fourth image data based on a second cutout position. See also figures 10-14).

For claim 10, which recites the method performed by the apparatus of claim 1, Schipper discloses this method as discussed in the rejection of claim 1.

5. Claims 1, 4-5, and 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Geradts et al., *Methods for Identification of Images Acquired with Digital Cameras* ("Geradts").

For claim 1, Geradts discloses a correlation detecting means for detecting correlation between said first image data and second image data for reference generated using said predetermined image generating apparatus (see the right image of figure 4 on page 506, pixel defects are visible if there is an image taken of a dark object. See also figure 5, pixel defects are visible on the CCD), and an identifying means for identifying if said first image data was generated using said image generating apparatus based on said correlation detected by said correlation detecting means (see left image of figure 4, pixel defects in a real image match pixel defects of a dark object. See also equation 4 on page 510, if the pixel defects found in a comparison of a reference image and an actual image exceed a threshold, the actual image was taken by the camera).

For claim 4, Geradts discloses a reference image generating means for generating a plurality of image data using said predetermined image generating apparatus (see page 507 "we counted these pixel defects by comparing five images acquired by the same camera") and averaging said plurality of image data to generate said second image data (see abstract, "errors can be visualized by averaging the images multiple times." See also figure 2 on page 507, ten blank images are averaged to show pixel defects) and said correlation detecting means detects said correlation using said second image data generated by said reference image generating means (see discussion of Figure 2 on page 507, it "was possible to determine the pixel defects in these cameras").

For claim 5, Geradts discloses a reference image generating means for generating a plurality of said second image data (see figure 4) by making light strike said light receiving elements in a plurality of states of different lens apertures (the lens aperture of the image on the left is different than that of the image on the right.) when said image generating apparatus makes light strike said plurality of light receiving elements through a lens (the images are taken when light goes through a lens onto the light receiving CCDs) and said correlation detecting means detects said correlation using said plurality of second image data generated by said reference image generating means (see page 508, correlation is detected using the several images that are made with different lens apertures, such as those shown in figure 4).

For claim 8, Geradts discloses an adding means for adding to said first image data additional data for preventing copyright infringement (this is the definition of a watermark, which is disclosed on page 511) when said identifying means identifies that said first image data was generated using said image generating apparatus (see the discussion of watermarking in section 3 on page 511, the watermark or serial number identifies that the image was made by the corresponding camera).

For claim 9, Geradts discloses said distinctive variations in light receiving sensitivity of said light receiving elements arise in the process of production of said light receiving elements and are difficult to artificially reproduce (see the discussion of pixel defects in section 2 pages 505-510).

For claim 10, which recites the method performed by the apparatus of claim 1, Geradts discloses this method as discussed in the rejection of claim 1.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Geradts in view of Chen et al., *Symmetric Phase-Only Matched Filtering of Fourier-Mellin Transforms* ("Chen").

Geradts does not disclose generating correlation data by successively shifting in two dimensions a relative position between the first and second images.

For claim 6, Chen discloses correlation detecting means generates correlation data showing as said correlation between said first image data and said second image data (see figure 1(a)) said correlation detected by successively shifting in two dimensions (see equation 20, R(u,v) for a grid M x K is determined) a relative position between an image of said first image data and an image of said second image data in units of image data corresponding to said light receiving elements (see section V Implementation from pp. 1159-1160, the two dimensional positions correspond to pixel positions where “The estimation accuracy” has “a sub-pixel precision”).

It would have been obvious to one of ordinary skill in this art at the time of the invention to modify the camera identification device of Geradts to include the correlation means of Chen for the advantages of obtaining a high discriminating power and an excellent robustness in the presence of noise as taught by Chen at col. 1 on page 1157.

For claim 7, Chen discloses a correlation detecting means (see section IV Fourier-Mellin Invariant Matching beginning on page 1158) that has a transforming means for orthogonal transformation of said first image data and said second image data to generate first frequency component data and second frequency component data (see steps 1 and 3, compute the Fourier transform), a dividing means for dividing each complex number data forming said first frequency component data by an absolute value of each complex number data to generate first complex number data (see equation 19, the complex number data is divided by an absolute value of each complex number data), and for dividing each complex number data forming said second frequency component data by an absolute value of each complex number data to generate second complex number data (see equation 19, the complex number data is divided by an absolute value of each complex number data), a substituting means for substituting each complex number data forming one of said first complex number data and said second complex number data with complex conjugate complex number data to generate third complex number data (see step 5, the complex conjugate is substituted for each complex number), a multiplying means for multiplying the one of said first complex number data and second complex number data not substituted by said substituting means and said third complex number data generated by said substituting means to generate fourth complex number data (see equation 19, the complex numbers are multiplied), and an inverse transformation circuit for inverse orthogonal transformation of said fourth complex number data generated by said multiplying means to generate said correlation data (see step 6 compute the inverse Fourier transform).

8. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurosawa et al., *CCD Fingerprint Method-Identification of a Video Camera from Videotaped Images* ("Kurosawa") in view of Chen.

For claim 11, Kurosawa discloses a holding means for holding a plurality of second image data for reference generated using said plurality of image generating apparatuses (see page 538 "we used 9 camcorders" and captured "one hundred playback frames for each camera") and an identifying means for identifying if said first image data was generated using any of said plurality of image generating apparatuses (see page 538 section 3.2, each camera has its own dot pattern that identifies whether an image was taken by that camera).

Kurosawa does not explicitly disclose the correlation means.

Chen discloses a correlation detecting means for detecting correlation between said first image data and said second image data held by said holding means (see page 1159 col. 1, Chen can "identify among a set of reference images the image that best matches some observed image," see also pages 1163-1165).

It would have been obvious to one of ordinary skill in this art at the time of the invention to modify the camera fingerprint device of Kurosawa to include the correlation means of Chen for the advantages of obtaining a high discriminating power and an excellent robustness in the presence of noise as taught by Chen at col. 1 on page 1157.

For claim 12, which recites the method performed by the apparatus of claim 11, Kurosawa with Chen performs the method as discussed in the rejection of claim 11.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Raynor in U.S. Patent Number 7,129,973 discloses a method for authenticating an image taken by a camera using noise from the CMOS image sensor.

Prager et al. in U.S. Patent Number 5,726,915 discloses a method of generating a signature for an image sensor that is derived from noise in the sensor's output signal.

U.S. Patent Nos. 7,031,493 issued to Fletcher el al.; 6,076,004 issued to Kanayama et al.; and 6,628,845 issued to Stone et al. disclose methods of correlating images using symmetric phase-only matched filtering of Fourier-Mellin transforms.

Wu et al. in U.S. Patent Number 6,285,775 discloses a method of altering pixels with a pattern to authenticate an image.

Aufrichtig et al. in U.S. Patent Number 6,661,456 discloses a pattern in an image derived from defective pixels in the image detector.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey S. Smith whose telephone number is 571 270-1235. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on 571 272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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January 24, 2007

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SUPERVISORY PATENT EXAMINER